CLAIMS

1. A multi-mode scanning imaging system for imaging an object, comprising:

a plurality of sets of optical elements, each set being disposed with respect to a corresponding image plane and configured to image respective portions of the object;

a scanning mechanism for producing relative movement between the sets and the object to scan the object;

image sensors corresponding to the sets of optical elements adapted for capturing image data representative of the respective portions of the object imaged thereby; and

a mode implementation system for combining the image data according to one or more desired modes of operation of the imaging system.

2. The imaging system of claim 1, wherein said sets of optical elements are adapted in conjunction with said scanning mechanism to scan the same portion of the object sequentially.

3. The imaging system of claim 2, wherein said image data corresponding to different sets of optical elements are registered with one another by said mode implementation system.

4. The imaging system of claim 3, wherein said image data corresponding to different sets of optical elements represent respectively different colors.

5. The imaging system of claim 3, wherein said image data corresponding to different sets of optical elements represent respectively different object planes.

6. The imaging system of claim 2, further comprising an illumination system, wherein said optical elements comprise microscope objectives, and wherein different sets of said microscope objectives are adapted to operate in at least two different modes of microscopy.

7. The imaging system of claim 6, wherein said different modes are selected from the group trans-illumination microscopy, epi-illumination microscopy, fluorescence microscopy, and two-photon microscopy.

8. The imaging system of claim 1, wherein said sets of optical elements are adapted in conjunction with said scanning mechanism to scan different portions of the object simultaneously.

9. The imaging system of claim 8, wherein at least two of said sets of optical elements are adapted to scan a larger portion of the object for a given quantity of said movement than can be scanned for the same quantity of said movement with only one of said sets of optical elements.

10. The imaging system of claim 9, wherein said mode implementation system is adapted to concatenate data captured from adjacent sets of optical elements.

11. The imaging system of claim 10, wherein said optical elements comprise microscope objectives.

12. The imaging system of claim 11, wherein each of said sets of optical elements comprises a microscope array.

13. The imaging system of claim 10, wherein said optical elements from a plurality of said sets collectively comprise a microscope array.

14. The imaging system of claim 1, wherein said optical elements comprise microscope objectives.

15. The imaging system of claim 14, wherein each of said sets of optical elements comprises a microscope array.

16. The imaging system of claim 1, wherein said optical elements from a plurality of said sets collectively comprise a microscope array.

17. The imaging system of claim 1, wherein said scanning mechanism comprises a tray and said sets of optical elements comprise discrete modules adapted to be removably supported by said tray.

18. A method for imaging of an object with an imaging system, comprising:

providing for the imaging system a plurality of sets of optical elements, each set being disposed with respect to a corresponding image plane and configured to image respective portions of the object;

producing relative movement between the sets and the object to scan the object;

capturing image data representative of the respective portions of the object; and

combining the image data according to one or more desired modes of operation of the imaging system.

19. The method of claim 18, further comprising scanning the same portion of the object sequentially.

20. The method of claim 19, further comprising registering said image data corresponding to different sets of optical elements with one another according to said one or more desired modes of operation of the imaging system.

21. The method of claim 20, wherein said image data corresponding to different sets of optical elements represent respectively different colors.

22. The method of claim 20, wherein said image data corresponding to different sets of optical elements represent respectively different object planes.

23. The method of claim 19, further comprising providing an illumination system, wherein said optical elements comprise microscope objectives, and wherein different sets of said microscope objectives are adapted to operate in at least two different modes of microscopy.

24. The method of claim 23, wherein said different modes are selected from the group trans-illumination microscopy, epi-illumination microscopy, fluorescence microscopy, and two-photon microscopy.

25. The method of claim 18, further comprising scanning different portions of the object simultaneously.

26. The method of claim 25, further comprising employing at least two of said sets of optical elements to scan a larger portion of the object for a given quantity of said movement than can be scanned for the same quantity of said movement with only one of said sets of optical elements.

27. The method of claim 26, wherein said step of combining includes concatenating data captured from adjacent sets of optical elements.

28. The method of claim 27, wherein said optical elements comprise microscope objectives.

29. The method of claim 28, wherein each of said sets of optical elements comprises a microscope array.

30. The method of claim 10, wherein said optical elements from a plurality of said sets collectively comprise a microscope array.

31. The method of claim 18, wherein said optical elements comprise microscope objectives.

32. The method of claim 31, wherein each of said sets of optical elements comprises a microscope array.

33. The method of claim 18, wherein said optical elements from a plurality of said sets collectively comprise a microscope array.

34. The method of claim 18, further comprising providing a tray and removably supporting said sets of optical elements as discrete modules by said tray.